

4.6 GREENHOUSE GAS EMISSIONS

INTRODUCTION

This section describes existing air quality conditions in the project area (including the project site, the applicable air district jurisdiction, and the air basin) and analyzes the potential greenhouse gas impacts, both temporary (i.e., construction) and long term (i.e., operational), that could result from the implementation of the Azusa TOD Specific Plan. The section also provides a description of the regulatory framework for air quality management on a federal, state, regional, and local level. In addition, to reduce impacts, mitigation measures are included when applicable. The greenhouse gas calculations are available in **Appendix 4.2**.

4.6.1 ENVIRONMENTAL SETTING

Climate Change and Greenhouse Gas Background

The natural process through which heat is retained in the troposphere¹ is called the greenhouse effect. The greenhouse effect traps heat in the troposphere through a three-fold process as follows: (1) short-wave radiation in the form of visible light emitted by the Sun is absorbed by the Earth as heat; (2) long-wave radiation re-emitted by the Earth; and (3) GHGs in the atmosphere absorbing or trapping the long-wave radiation and re-emitting it back towards the Earth and into space. This third process is the focus of current climate change actions.

While water vapor and carbon dioxide (CO₂) are the most abundant GHG, other trace GHGs have a greater ability to absorb and re-radiate long-wave radiation. To gauge the potency of GHGs, scientists have established a Global Warming Potential (GWP) for each GHG based on its ability to absorb and re-emit long-wave radiation over a specific period. The GWP of a gas is determined using CO₂ as the reference gas with a GWP of 1 over 100 years. For example, a gas with a GWP of 10 is 10 times more potent than CO₂ over 100 years. The use of GWP allows GHG emissions to be reported using CO₂ as a baseline. The sum of each GHG multiplied by its associated GWP is referred to as carbon dioxide equivalents (CO₂e). This essentially means that 1 metric ton of a GHG with a GWP of 10 has the same climate change impacts as 10 metric tons of CO₂.

¹ The troposphere is the bottom layer of the atmosphere, which varies in height from the Earth's surface to 10 to 12 kilometers.

State law defines GHGs to include the following compounds:²

- **Carbon Dioxide (CO₂).** CO₂ is primarily generated from fossil fuel combustion from stationary and mobile sources. CO₂ is the reference gas (GWP of 1) for determining the GWPs of other GHGs.
- **Methane (CH₄).** CH₄ is emitted from biogenic sources (i.e., resulting from the activity of living organisms), incomplete combustion in forest fires, landfills, manure management, and leaks in natural gas pipelines. The GWP of methane is 21.
- **Nitrous Oxide (N₂O).** N₂O produced by human-related sources including agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production. The GWP of nitrous oxide is 310.
- **Hydrofluorocarbons (HFCs).** HFCs are typically used as refrigerants in both stationary refrigeration and mobile air conditioning. The GWPs of HFCs ranges from 140 for HFC-152a to 11,700 for HFC-23.
- **Perfluorocarbons (PFCs).** PFCs are compounds consisting of carbon and fluorine. They are primarily created as a byproduct of aluminum production and semiconductor manufacturing. The GWPs of PFCs range from 5,700 to 11,900.
- **Sulfur Hexafluoride (SF₆).** SF₆ is a colorless, odorless, nontoxic, nonflammable gas. It is most commonly used as an electrical insulator in high voltage equipment that transmits and distributes electricity. Sulfur hexafluoride has a GWP of 23,900. It is not prevalent in the atmosphere (4 parts per trillion [ppt] in 1990 versus 365 parts per million [ppm] of CO₂).³

The primary GHGs of concern relative to the Azusa TOD Specific Plan are CO₂, CH₄, and N₂O. These three GHGs are generally emitted from combustion activities. HFCs are associated with refrigeration and air conditioning and are accounted for in this analysis with respect to motor vehicle air conditioning system leakage. The other GHGs listed above are related to specific industrial uses and not anticipated to be emitted in measurable or substantial quantities.

State of California Greenhouse Gas Emissions Inventory

The California Air Resources Board (CARB) compiles GHG inventories for the State of California. Based on the 2012 GHG inventory data (the latest year for which data are available), California emitted 459 MMTCO_{2e} (million MTCO_{2e}) including emissions resulting from imported electrical power in 2012.⁴

² All Global Warming Potentials are given as 100-year values. Unless noted otherwise, all Global Warming Potentials were obtained from the Intergovernmental Panel on Climate Change. *Climate Change 1995: The Science of Climate Change – Contribution of Working Group I to the Second Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, UK: Cambridge University Press, 1996.

³ US Environmental Protection Agency, “High GWP Gases and Climate Change,” <http://www.epa.gov/highgwp/scientific.html#sf6>. n.d.

⁴ California Air Resources Board (CARB), “California Greenhouse Gas 2000-2012 Inventory by Scoping Plan Category - Summary,” <http://www.arb.ca.gov/cc/inventory/data/data.htm>. 2014.

Based on the CARB inventory data and GHG inventories compiled by the World Resources Institute, California's total statewide GHG emissions rank second in the United States (Texas is number one).⁵

The primary contributors to GHG emissions in California are transportation, electric power production from both in-state and out-of-state sources, industry, agriculture and forestry, and other sources, which include commercial and residential activities. **Table 4.6-1, GHG Emissions in California**, provides a summary of GHG emissions reported in California in 1990 and 2012 separated by categories defined by the United Nations Intergovernmental Panel on Climate Change (IPCC).

Between 1990 and 2012, the population of California grew by approximately 7.9 million (from 29.8 to 37.7 million).⁶ This represents an increase of approximately 26.5 percent from 1990 population levels. In addition, the California economy, measured as gross state product, grew from \$788 billion in 1990 to \$2.1 trillion in 2012 representing an increase of approximately 166 percent (over twice the 1990 gross state product).⁷ Despite the population and economic growth, California's gross GHG emissions grew by only approximately 6 percent. The California Energy Commission (CEC) attributes the slow rate of growth to the success of California's renewable energy programs and its commitment to clean air and clean energy.⁸

⁵ CARB, "California Greenhouse Gas 2000-2008 Inventory –2000-2012," 2014.

⁶ California Department of Finance, "E-5 Population and Housing Estimates for Cities, Counties and the State, 2011-2014, with 2010 Benchmark," <http://www.dof.ca.gov/research/demographic/reports/estimates/e-5/2011-20/view.php>. 2014.

⁷ California Department of Finance, "Financial & Economic Data: Gross Domestic Product, California," http://www.dof.ca.gov/html/fs_data/latestecondata/FS_Misc.htm. 2014. Amounts are based on current dollars as of the data of the report. June 11, 2014.

⁸ California Energy Commission, *Inventory of California Greenhouse Gas Emissions and Sinks 1990 to 2004*, 2006.

**Table 4.6-1
GHG Emissions in California**

Source Category	1990 (MMTCO₂e)	Percent of Total	2012 (MMTCO₂e)	Percent of Total
ENERGY	386.41	89.2%	376.42	82.1%
Energy Industries	157.33	36.3%	144.72	31.6%
Manufacturing Industries & Construction	24.24	5.6%	19.89	4.3%
Transport	150.02	34.6%	166.56	36.3%
Other Sectors (Residential/Commercial/Institutional)	48.19	11.1%	45.25	9.9%
Solid Fuels	1.38	0.3%	0.02	0.0%
Fugitive Emissions from Oil & Natural Gas	2.94	0.7%	4.39	1.0%
Fugitive Emissions from Geothermal Energy Production	2.31	0.5%	0.83	0.2%
Pollution Control Devices	--	--	0.02	0.0%
INDUSTRIAL PROCESSES & PRODUCT USE	18.34	4.2%	31.95	7.0%
Mineral Industry	4.85	1.1%	4.69	1.0%
Chemical Industry	2.34	0.5%	0.05	0.0%
Non-Energy Products from Fuels & Solvent Use	2.29	0.5%	1.64	0.4%
Electronics Industry	0.59	0.1%	0.45	0.1%
Substitutes for Ozone Depleting Substances	0.04	0.0%	17.73	3.9%
Other Product Manufacture and Use	3.18	0.7%	0.85	0.2%
Other	5.05	1.2%	6.54	1.4%
AGRICULTURE, FORESTRY, & OTHER LAND USE	19.11	4.4%	34.14	7.4%
Livestock	11.67	2.7%	23.92	5.2%
Land	0.19	0.0%	--	0.0%
Aggregate Sources & Non-CO ₂ Sources on Land	7.26	1.7%	10.22	2.2%
WASTE	9.42	2.2%	10.91	2.4%
Solid Waste Disposal and Biological Treatment	6.26	1.4%	7.97	1.7%
Biological Treatment of Solid Waste	--	--	0.52	0.1%
Wastewater Treatment & Discharge	3.17	0.7%	2.42	0.5%
EMISSIONS SUMMARY				
Gross California Emissions	433.29		458.68	
Sinks from Forests and Rangelands	-6.69		--	
Net California Emissions	426.60		--	

Sources:

¹ California Air Resources Board, "California Greenhouse Gas 1990-2004 Inventory by IPCC Category - Summary," <http://www.arb.ca.gov/cc/inventory/archive/archive.htm>. 2011.

² California Air Resources Board, "California Greenhouse Gas 2000-2012 Inventory by IPCC Category - Summary," <http://www.arb.ca.gov/cc/inventory/data/data.htm>. 2014.

Global Ambient CO₂, CH₄, and N₂O Concentrations

Air trapped by ice has been extracted from core samples taken from polar ice sheets to determine the global atmospheric variation of carbon dioxide, methane, and nitrous oxide from before the start of the industrialization, around 1750, to over 650,000 years ago. For that period, it was found that carbon dioxide concentrations ranged from 180 ppm to 300 ppm. For the period from around 1750 to the present, global carbon dioxide concentrations increased from a pre-industrialization period concentration of 280 ppm to 395 ppm in 2013, with the 2013 value far exceeding the upper end of the pre-industrial period range.⁹ Recent values continue this upward trend. Global methane and nitrous oxide concentrations show similar increases for the same period (see **Table 4.6-2, Comparison of Global Pre-Industrial and Current GHG Concentrations**).

**Table 4.6-2
Comparison of Global Pre-Industrial and Current GHG Concentrations**

Greenhouse Gas	Natural Range for Last 650,000 Years¹ (ppm)	Year 1750 Concentrations (Early Industrial Period)¹ (ppm)	Year 2013 Concentrations² (ppm)
Carbon Dioxide (CO ₂)	180 to 300	280	395
Methane (CH ₄)	0.320 to 0.790	0.715	1.893/1.762
Nitrous Oxide (N ₂ O)	0.180 to 0.260	0.270	0.326/0.324

Sources:

¹ Intergovernmental Panel on Climate Change, *Climate Change 2007: The Physical Science Basis*, (2007) 3, 100.

² Carbon Dioxide Information Analysis Center, "Recent Greenhouse Gas Concentrations," http://cdiac.ornl.gov/pns/current_ghg.html. 2014.

Effects of Global Climate Change

The primary effect of global climate change has been a rise in the average global tropospheric temperature of 0.2° Celsius per decade, determined from meteorological measurements worldwide between 1990 and 2005.¹⁰ Climate change modeling using 2000 emission rates shows that further

⁹ Carbon Dioxide Information Analysis Center, "Recent Greenhouse Gas Concentrations," http://cdiac.ornl.gov/pns/current_ghg.html. 2014.

¹⁰ Intergovernmental Panel on Climate Change, "Climate Change 2007: The Physical Science Basis, Summary for Policymakers," http://ipcc-wg1.ucar.edu/wg1/docs/WG1AR4_SPM_PlenaryApproved.pdf. 2007.

warming is likely to occur, which would induce further changes in the global climate system during the current century.¹¹ Changes to the global climate system, ecosystems, and to California could include:

- declining sea ice and mountain snowpack levels, thereby increasing sea levels and sea surface evaporation rates with a corresponding increase in tropospheric water vapor due to the atmosphere's ability to hold more water vapor at higher temperatures;¹²
- rising average global sea levels primarily due to thermal expansion and the melting of glaciers, ice caps, and the Greenland and Antarctic ice sheets;¹³
- changing weather patterns, including changes to precipitation, ocean salinity, and wind patterns, and more energetic aspects of extreme weather including droughts, heavy precipitation, heat waves, extreme cold, and the intensity of tropical cyclones;¹⁴
- declining Sierra snowpack levels, which account for approximately half of the surface water storage in California, by 70 percent to as much as 90 percent over the next 100 years;¹⁵
- increasing the number of days conducive to ozone formation by 25 to 85 percent (depending on the future temperature scenario) in high ozone areas located in the Southern California area and the San Joaquin Valley by the end of the 21st century;¹⁶
- increasing the potential for erosion of California's coastlines and sea water intrusion into the Sacramento and San Joaquin Delta and associated levee systems due to the rise in sea level;¹⁷
- increasing pest infestation making California more susceptible to forest fires;¹⁸ and
- increasing the demand for electricity by 1 to 3 percent by 2020 due to rising temperatures resulting in hundreds of millions of dollars in extra expenditures.¹⁹

In June 2010, CARB released a report, *Climate Change Impact on Air Quality in California*, which studied how climate change will influence air quality in California through changes to meteorology and

11 "Climate Change 2007: The Physical Science Basis, Summary for Policymakers," 2007.

12 "Climate Change 2007: The Physical Science Basis, Summary for Policymakers," 2007.

13 Intergovernmental Panel on Climate Change, "Climate Change 2007: The Physical Science Basis, Summary for Policymakers," http://ipcc-wg1.ucar.edu/wg1/docs/WG1AR4_SPM_PlenaryApproved.pdf. 2007.

14 "Climate Change 2007: The Physical Science Basis, Summary for Policymakers," 2007.

15 California Environmental Protection Agency, Climate Action Team, *Climate Action Team Report to Governor Schwarzenegger and the Legislature*, 2006.

16 *Climate Action Team Report to Governor Schwarzenegger and the Legislature*, 2006.

17 *Climate Action Team Report to Governor Schwarzenegger and the Legislature*, 2006.

18 *Climate Action Team Report to Governor Schwarzenegger and the Legislature*, 2006.

19 *Climate Action Team Report to Governor Schwarzenegger and the Legislature*, 2006.

emissions.²⁰ The report analyzed the effect of temperature and other meteorological changes consistent with future predicted meteorological conditions from Global Climate Models (GCMs) on ozone and particulate matter concentrations with a focus on the South Coast Air Basin and the San Joaquin Valley Air Basin. According to the modeling results, by 2050, temperature and other meteorological changes predicted to occur due to a changing climate could increase the number of days with conditions likely to encourage ozone concentrations greater than 90 parts per billion (equal to the state 1-hour average ozone ambient air quality standard) anywhere from 6 to 30 days per year under various GCM scenarios.²¹ This climate-change increase is referred to as a climate penalty. The results of the report indicate that warmer future temperatures would require air quality management districts and air pollution control districts to implement additional emissions control regulations in affected air basins in California to offset the climate penalty, particularly for ozone.

In 2009, the California Natural Resources Agency (CNRA) published the *California Climate Adaptation Strategy*²² as a response to the Governor's Executive Order S-13-2008. The CNRA report lists specific recommendations for state and local agencies to best adapt to the anticipated risks posed by a changing climate. In accordance with the *California Climate Adaptation Strategy*, the California Energy Commission (CEC) was directed to develop a web site on climate change scenarios and impacts that would be beneficial for local decision makers.²³ The website, known as Cal-Adapt, became operational in 2011.²⁴ According to the Cal-Adapt website, the project region could result in an average increase in temperature of approximately 6 to 10 percent (about 3.5 to 5.8° Fahrenheit) by 2070–2090, compared to the baseline 1961-1990 period. According to the Cal-Adapt website, this represents a projection of potential future climate scenarios. The data are comprised of the average values from a variety of scenarios and models and are meant to illustrate how the climate may change based on a variety of different potential social and economic factors.

²⁰ Kleeman, M. J., Chen, S., and Harley, R.A., *Climate Change Impact on Air Quality in California: Report to the California Air Resources Board*, 2010.

²¹ Kleeman, M. J., Chen, S., and Harley, R.A., *Climate Change Impact on Air Quality in California: Report to the California Air Resources Board*, 2010. 95.

²² California Natural Resources Agency, Climate Action Team, *2009 California Climate Adaptation Strategy: A Report to the Governor of the State of California in Response to Executive Order S-13-2008*, 2009.

²³ California Natural Resources Agency, Climate Action Team, *2009 California Climate Adaptation Strategy: A Report to the Governor of the State of California in Response to Executive Order S-13-2008*, 2009. 9.

²⁴ The Cal-Adapt website address is: <http://cal-adapt.org>.

4.6.2 REGULATORY FRAMEWORK

Federal

On September 15, 2009, the US EPA and the Department of Transportation's (DOT) National Highway Traffic Safety Administration (NHTSA) issued a joint proposal to establish a national program consisting of new standards for model year 2012 through 2016 light-duty vehicles that will reduce GHG emissions and improve fuel economy. In 2012, passenger cars and light-duty trucks would have to meet an average emissions standard of 295 grams of CO₂ per mile and 30.1 miles per gallon.²⁵ By 2016, the vehicles would have to meet an average standard of 250 grams of CO₂ per mile and 35.5 miles per gallon.²⁶ The final standards were adopted by the US EPA and DOT on April 1, 2010.

On December 7, 2009, the US EPA Administrator signed two distinct findings regarding GHGs under section 202(a) of the Clean Air Act:

- **Endangerment Finding:** The Administrator finds that the current and projected concentrations of the six key well-mixed GHGs (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) in the atmosphere threaten the public health and welfare of current and future generations.
- **Cause or Contribute Finding:** The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

While these findings do not impose additional requirements on industry or other entities, this action was a prerequisite to finalizing the US EPA's proposed GHG emissions standards for light-duty vehicles, as discussed above.

State

Title 24 Building Standards Code

The CEC first adopted Energy Efficiency Standards for Residential and Nonresidential Buildings (California Code of Regulations, Title 24, Part 6) in 1978 in response to a legislative mandate to reduce energy consumption in the state. Although not originally intended to reduce GHG emissions, increased energy efficiency, and reduced consumption of electricity, natural gas, and other fuels would result in

²⁵ US Environmental Protection Agency, "EPA and NHTSA Propose Historic National Program to Reduce Greenhouse Gases and Improve Fuel Economy for Cars and Trucks," <http://epa.gov/otaq/climate/regulations/420f09047a.htm>. 2009.

²⁶ US EPA, "EPA and NHTSA Propose Historic National Program," 2009.

fewer GHG emissions from residential and nonresidential buildings subject to the standard. The standards are updated periodically to allow for the consideration and inclusion of new energy efficiency technologies and methods.

Part 11 of the Title 24 Building Standards Code is referred to as the California Green Building Standards Code (CALGreen Code). The purpose of the CALGreen Code is to “improve public health, safety and general welfare by enhancing the design and construction of buildings through the use of building concepts having a positive environmental impact and encouraging sustainable construction practices in the following categories: (1) Planning and design; (2) Energy efficiency; (3) Water efficiency and conservation; (4) Material conservation and resource efficiency; and (5) Environmental air quality.”²⁷ The CALGreen Code is not intended to substitute for or be identified as meeting the certification requirements of any green building program that is not established and adopted by the California Building Standards Commission (CBSC). Part 11 of the Title 24 Building Standards Code became effective on January 1, 2011. Unless otherwise noted in the regulation, all newly constructed buildings in California are subject to the requirements of the CALGreen Code.

Renewables Portfolio Standard

In 2002, Senate Bill 1078 (SB 1078, Sher) established California’s Renewables Portfolio Standard (RPS) which requires investor-owned utilities, such as Pacific Gas and Electric, Southern California Edison, and San Diego Gas and Electric, to increase energy production from renewable sources by 1 percent per year, up to a minimum of 20 percent of total energy generation by 2017. SB 107 (Simitian), signed by the Governor on September 26, 2008, accelerated the Renewable Portfolio Standard by requiring investor-owned utilities to meet the 20 percent target by 2010.

On September 15, 2009, the Governor issued Executive Order S-21-0911 requiring CARB, under its AB 32 authority, to adopt regulations to meet a 33 percent RPS target by 2020. The CARB regulations would use a phased-in or tiered requirement to increase the amount of electricity from eligible renewable sources over an eight-year period beginning in 2012. CARB adopted the regulation in September 2010. In March 2011, the Legislature passed SB X1-2, which was signed into law by the Governor. SB X1-2 requires utilities to procure renewable energy products equal to 33 percent of retail sales by December 31, 2020 and also established interim targets: 20 percent by December 31, 2013 and 25 percent by December 31, 2016. SB X1-2 also includes publicly owned utilities in California.

²⁷ California Building Standards Commission, 2008 California Green Building Standards Code, 2009. 3.

Assembly Bill 1493

Assembly Bill 1493 (AB 1493, Pavley) was enacted on July 22, 2002 to reduce CO₂ emissions from the transportation sector. Under AB 1493, CARB set GHG emission standards for passenger vehicles, light-duty trucks, and other vehicles whose primary use is noncommercial personal transportation. The standards were adopted in September 2004 and were to be phased in during the 2009 through 2016 model years. However, before the regulation could go into effect, the US EPA had to grant California a waiver under the federal Clean Air Act (CAA), which ordinarily preempts state regulation of motor vehicle emission standards. The US EPA did not issue the waiver until June 30, 2009.

On September 15, 2009, the US EPA and the Department of Transportation's (DOT) National Highway Traffic Safety Administration (NHTSA) issued a joint proposal to establish a national program consisting of new standards for model year 2012 through 2016 light-duty vehicles. The proposed standards would be phased in and would require passenger cars and light-duty trucks to comply with a declining CO₂ emissions standard. In 2012, passenger cars and light-duty trucks would have to meet an average emissions standard of 295 grams of CO₂ per mile and 30.1 miles per gallon.²⁸ By 2016, the vehicles would have to meet an average standard of 250 grams of CO₂ per mile and 35.5 miles per gallon.²⁹ These standards were formally adopted by the US EPA and DOT on April 1, 2010. In light of the US EPA and NHTSA standards, California—and states adopting California emissions standards—have agreed to defer to the proposed national standard through model year 2016. The 2016 endpoint of the federal and state standards is similar, although the federal standard ramps up slightly more slowly than required under the state standard. The state standards (called the Pavley standards) require additional reductions in CO₂ emissions beyond 2016 (referred to as Pavley Phase II standards), which have not yet been adopted.

Executive Order S-3-05 and the Climate Action Team

In June 2005, Governor Schwarzenegger established California's GHG emissions reduction targets in Executive Order S-3-05. The Executive Order established the following goals: GHG emissions should be reduced to 2000 levels by 2010, 1990 levels by 2020, and 80 percent below 1990 levels by 2050. The Secretary of California Environmental Protection Agency (Cal EPA) is required to coordinate efforts of various agencies in order to collectively and efficiently reduce GHGs. Some of the agency representatives involved in the GHG reduction plan include the Secretary of the Business, Transportation, and Housing Agency, the Secretary of the Department of Food and Agriculture, the

²⁸ US Environmental Protection Agency, "EPA and NHTSA Propose Historic National Program to Reduce Greenhouse Gases and Improve Fuel Economy for Cars and Trucks," <http://epa.gov/otaq/climate/regulations/420f09047a.htm>. 2009.

²⁹ US EPA, "EPA and NHTSA Propose Historic Nation Program," 2009.

Secretary of the Resources Agency, the Chairperson of CARB, the Chairperson of the CEC, and the President of the Public Utilities Commission. Representatives from these agencies comprise the Climate Action Team.

Assembly Bill 32

To further the goals established in Executive Order S-3-05, the Legislature enacted Assembly Bill 32 (AB 32, Nuñez and Pavley), the California Global Warming Solutions Act of 2006, which was signed into law on September 27, 2006. AB 32 represents the first enforceable statewide program to limit GHG emissions from all major industries with penalties for noncompliance. AB 32 requires the state to undertake several actions – the major requirements are discussed below.

CARB Early Action Measures

CARB is responsible for carrying out and developing the programs and requirements necessary to achieve the goals of AB 32—the reduction of California's GHG emissions to 1990 levels by 2020. The first action under AB 32 resulted in CARB's adoption of a report listing three specific early action greenhouse gas emission reduction measures on June 21, 2007. On October 25, 2007, CARB approved an additional six early action GHG reduction measures under AB 32. CARB has adopted regulations for all early action measures. The original three adopted early action regulations meeting the narrow legal definition of “discrete early action GHG reduction measures” include:

- a low-carbon fuel standard to reduce the “carbon intensity” of California fuels;
- reduction of refrigerant losses from motor vehicle air conditioning system maintenance to restrict the sale of “do-it-yourself” automotive refrigerants; and
- increased methane capture from landfills to require broader use of state-of-the-art methane capture technologies.

The additional six early action regulations adopted on October 25, 2007, also meeting the narrow legal definition of “discrete early action GHG reduction measures,” include:

- reduction of aerodynamic drag, and thereby fuel consumption, from existing trucks and trailers through retrofit technology;
- reduction of auxiliary engine emissions of docked ships by requiring port electrification;
- reduction of perfluorocarbons from the semiconductor industry;
- reduction of propellants in consumer products (e.g., aerosols, tire inflators, and dust removal products);

- require that all tune-up, smog check and oil change mechanics ensure proper tire inflation as part of overall service in order to maintain fuel efficiency; and
- restriction on the use of sulfur hexafluoride (SF₆) from non-electricity sectors if viable alternatives are available.

State of California 1990 Greenhouse Gas Inventory

As required under AB 32, on December 6, 2007, CARB approved the 1990 greenhouse gas emissions inventory, thereby establishing the emissions limit for 2020. The 2020 emissions limit was set at 427 MMTCO_{2e}. The inventory revealed that in 1990 transportation, with 35 percent of the state's total emissions, was the largest single sector generating carbon dioxide, followed by industrial emissions, 24 percent; imported electricity, 14 percent; in-state electricity generation, 11 percent; residential use, 7 percent; agriculture, 5 percent; commercial uses, 3 percent; and forestry emissions (excluding sinks) less than 1 percent. These figures represent the 1990 values. AB 32 does not require individual sectors to meet their individual 1990 GHG emissions inventory; the total statewide emissions are required to meet the 1990 threshold by 2020.

Climate Change Scoping Plan

As indicated above, AB 32 requires CARB to adopt a scoping plan indicating how reductions in significant GHG sources will be achieved through regulations, market mechanisms, and other actions. CARB released the *Climate Change Scoping Plan* in October 2008, which contained an outline of the proposed state strategies to achieve the 2020 GHG emission limits. The CARB Governing Board approved the *Climate Change Scoping Plan* on December 11, 2008. The *Climate Change Scoping Plan* indicates how emissions reductions will be achieved from significant sources of GHGs via regulations, market mechanism, and other actions. The *Climate Change Scoping Plan* identifies 18 recommended strategies the state should implement to achieve AB 32. CARB has identified ongoing programs and has adopted regulations for a number of individual measures to reduce GHG emissions in accordance with the *Climate Change Scoping Plan* strategies. CARB approved the first updated to the *Climate Change Scoping Plan* on May 22, 2014.

Key elements of the *Climate Change Scoping Plan* include the following recommendations:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards
- Achieving a statewide renewables energy mix of 33 percent
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system

- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California and pursuing policies and incentives to achieve those targets
- Adopting and implementing measures pursuant to existing state laws and policies, including California’s clean car standards, goods movement measures, and the Low Carbon Fuel Standard
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the state’s long-term commitment to AB 32 implementation.

Under the *Climate Change Scoping Plan*, approximately 85 percent of the state’s emissions are subject to a cap-and-trade program where covered sectors are placed under a declining emissions cap. The emissions cap incorporates a margin of safety whereby the 2020 emissions limit will still be achieved even in the event that uncapped sectors do not fully meet their anticipated emission reductions. Emissions reductions will be achieved through regulatory requirements and the option to reduce emissions further or purchase allowances to cover compliance obligations. It is expected that emission reductions from the cap-and-trade program will account for a significant portion of the reductions required by AB 32.

In connection with preparation of the supplement to the Functional Equivalent Document, CARB released revised estimates of the expected 2020 emission reductions in consideration of the economic recession and the availability of updated information from development of measure-specific regulations. Incorporation of revised estimates in consideration of the economic recession reduced the projected 2020 emissions from 596 metric tons of CO₂ equivalent (MTCO_{2e}) to 545 MTCO_{2e}³⁰. Under this scenario, achieving the 1990 emissions level would require a reduction of GHG emissions of 118 MTCO_{2e}, or 21.7 percent (down from 28.5 percent), to achieve in 2020 emissions levels in the “business as usual” condition. The 2020 AB 32 baseline was also updated to account for measures incorporated into the inventory, including Pavley (vehicle model-years 2009 - 2016) and the renewable portfolio standard (12% - 20%). Inclusion of these measures further reduced the 2020 baseline to 507 MTCO_{2e}. As a result, based on both the economic recession and the availability of updated information from development of measure-specific regulations, achieving the 1990 emission level would now require a reduction of GHG emissions of 80 MTCO_{2e} or a reduction by approximately 16 percent (down from 28.5 percent) to achieve in 2020 emissions levels in the “business as usual” or NAT condition^{31,32}.

On February 10, 2014, CARB released a discussion draft first update to the Scoping Plan. The discussion draft recalculates 1990 GHG emissions using IPCC Fourth Assessment Report released in 2007. Using the

³⁰ California Air Resources Board, *Status of Scoping Plan Recommended Measures*, July 25, 2011. Available at http://www.arb.ca.gov/cc/scopingplan/status_of_scoping_plan_measures.pdf. Accessed August 22, 2013.

³¹ California Air Resources Board, *Status of Scoping Plan Recommended Measures*, July 25, 2011. Available at http://www.arb.ca.gov/cc/scopingplan/status_of_scoping_plan_measures.pdf. Accessed August 22, 2013.

³² California Air Resources Board, *Final Supplement to the AB 32 Scoping Plan Functional Equivalent Document* Available at http://www.arb.ca.gov/cc/scopingplan/document/final_supplement_to_sp_fed.pdf. Accessed September 16, 2013.

AR4 global warming potentials GWPs, the 427 MTCO_{2e} 1990 emissions level and 2020 GHG emissions limit would be slightly higher, at 431 MTCO_{2e}.³³ Based on the revised estimates of expected 2020 emissions identified in the draft first update to the Scoping Plan, achieving the 1990 emission level would require a reduction of 76 MTCO_{2e} (down from 169 MTCO_{2e}) or a reduction by approximately 15 percent (down from 28.5 percent) to achieve in 2020 emissions levels in the “business as usual” or NAT condition.^{34, 35, 36} As stated above CARB approved the updated Scoping Plan in May 2014.

Executive Order S-1-07

On January 18, 2007, California set a new Low Carbon Fuel Standard (LCFS) for transportation fuels sold within the state. Executive Order S-1-07 sets a declining standard for GHG emissions measured in CO₂-equivalent grams per unit of fuel energy sold in California. The target of the LCFS is to reduce the carbon intensity of California passenger vehicle fuels by at least 10 percent by 2020. The LCFS will apply to refiners, blenders, producers, and importers of transportation fuels and will use market-based mechanisms to allow these providers to choose how they reduce emissions during the fuel cycle using the most economically feasible methods. CARB identified the LCFS as an early action item under AB 32 and the final regulation was adopted on April 23, 2009.

Senate Bill 375

The California Legislature passed SB 375 (Steinberg) on September 1, 2008. SB 375 requires CARB, working in consultation with the metropolitan planning organizations (MPOs), to set regional greenhouse gas reduction targets for the automobile and light truck sector for 2020 and 2035. The target must then be incorporated within that region’s Regional Transportation Plan (RTP), which is used for long-term transportation planning, in a Sustainable Communities Strategy (SCS). Certain transportation planning and programming activities would then need to be consistent with the SCS; however, SB 375 expressly provides that the SCS does not regulate the use of land, and further provides that local land use plans and policies (e.g., General Plan) are not required to be consistent with either the RTP or SCS.

33 California Air Resources Board, Climate Change Scoping Plan First Update, Discussion Draft for Public Review and Comment, February 2014 Available at http://www.arb.ca.gov/cc/scopingplan/2013_update/draft_proposed_first_update.pdf. Accessed: March 2014.

34 California Air Resources Board, Status of Scoping Plan Recommended Measures, July 25, 2011. Available at http://www.arb.ca.gov/cc/scopingplan/status_of_scoping_plan_measures.pdf. Accessed: March 2014.

35 California Air Resources Board, Final Supplement to the AB 32 Scoping Plan Functional Equivalent Document Available at http://www.arb.ca.gov/cc/scopingplan/document/final_supplement_to_sp_fed.pdf. Accessed: March 2014.

36 California Air Resources Board, Climate Change Scoping Plan First Update, Discussion Draft for Public Review and Comment, October 2013 Available at http://www.arb.ca.gov/cc/scopingplan/2013_update/discussion_draft.pdf. Accessed March 2014.

On August 9, 2010, CARB staff issued the *Proposed Regional Greenhouse Gas Emission Reduction Targets for Automobiles and Light Trucks Pursuant To Senate Bill 375*.³⁷ CARB staff proposed draft per capita reduction targets for the four largest MPOs (Bay Area, Sacramento, Southern California, and San Diego) of 7 to 8 percent for 2020 and reduction targets between 13 to 16 percent for 2035. For the Southern California Association of Governments (SCAG), which is the metropolitan planning organization (MPO) for the region in which the project area is located, CARB established a draft per capita reduction target of 8 percent for 2020 and 13 percent for 2035. Of note, the proposed reduction targets explicitly exclude emission reductions expected from the AB 1493 and the low carbon fuel standard regulations. CARB adopted the final targets (the same targets as the proposed draft targets) on September 23, 2010.

Local

South Coast Air Quality Management District

In April 2008, the South Coast Air Quality Management District (SCAQMD), in order to provide guidance to local lead agencies on determining the significance of GHG emissions identified in California Environmental Quality Act (CEQA) documents, convened a GHG CEQA Significance Threshold Working Group.³⁸ The goal of the working group is to develop and reach consensus on an acceptable CEQA significance thresholds for GHG emissions that may be utilized on an interim basis until CARB (or some other state agency) develops guidance on assessing the significance of GHG emissions under CEQA.

Initially, SCAQMD staff presented the working group with a significance threshold that could be applied to various types of projects – residential; non-residential; industrial; etc. However, the threshold is still under development. In December 2008, staff presented the SCAQMD Governing Board with a significance threshold for stationary source projects where it is the lead agency. This threshold uses a tiered approach to determine a project’s significance, with 10,000 MTCO_{2e} as a screening numerical threshold.

At present time, the SCAQMD has not adopted thresholds for residential, commercial or projects such as the one analyzed in this study. The SCAQMD is considering a tiered approach to determine the significance of residential and commercial projects and the most recent draft approach that was published in September 2010 is as follows:

- **Tier 1:** Is the project exempt from further analysis under existing statutory or categorical exemptions? If yes, there is a presumption of less than significant impacts with respect to climate change.

³⁷ California Air Resources Board (CARB), *Staff Report: Proposed Regional Greenhouse Gas Emission Reduction Targets For Automobiles And Light Trucks Pursuant To Senate Bill 375*, 2010.

³⁸ For more information see: <http://www.aqmd.gov/ceqa/handbook/GHG/GHG.html>.

- **Tier 2:** Is the project's GHG emissions within the GHG budgets in an approved regional plan? (The plan must be consistent with *State CEQA Guidelines* Sections 15064(h)(3), 15125(d), or 15152(s).) If yes, there is a presumption of less than significant impacts with respect to climate change.
- **Tier 3:** Is the project's incremental increase in GHG emissions below or mitigated to less than the significance screening level (10,000 MTCO_{2e} per year for industrial projects; 3,500 MTCO_{2e} for residential projects; 1,400 MTCO_{2e} for commercial projects; 3,000 MTCO_{2e} for mixed-use or all land use projects)? If yes, there is a presumption of less than significant impacts with respect to climate change.
- **Tier 4:** Does the project meet one of the following performance standards? If yes, there is a presumption of less than significant impacts with respect to climate change.
 - **Option #1:** Achieve some percentage reduction in GHG emissions from a base case scenario, including land use sector reductions from AB 32.
 - **Option #2:** For individual projects, achieve a project-level efficiency target of 4.8 MTCO_{2e} per service population by 2020 or a target of 3.0 MTCO_{2e} per service population by 2035. For plans, achieve a plan-level efficiency target of 6.6 MTCO_{2e} per service population by 2020 or a target of 4.1 MTCO_{2e} per service population by 2035.
- **Tier 5:** Projects should obtain GHG emission offsets to reduce significant impacts. Offsets in combination with any mitigation measures should achieve the target thresholds for any of the above Tiers. Otherwise, project impacts would remain significant.

The SCAQMD has not announced when staff is expecting to present a finalized version of these thresholds to the Governing Board. The SCAQMD has also adopted Rules 2700, 2701, and 2702 that establishes a GHG reduction program within the SCAQMD; however, GHG emission reduction protocols pursuant to these rules have only been established for boilers and process heaters, forestry, and manure management reduction projects.

County of Los Angeles

In January 2007, the Los Angeles County Board of Supervisors adopted the Countywide Energy and Environmental Policy (Policy), which provides guidelines for sustainability and green building design within County departments. The Policy states that the County will join the California Climate Action Registry (CCAR) to establish goals for reducing GHG emissions. The Policy also incorporates a sustainable building program into County capital improvement projects and seeks to integrate energy efficient and sustainable designs into future County building plans.³⁹

³⁹ County of Los Angeles. 3.045 Energy and Environmental Policy. December 19, 2006. Available online. <http://countypolicy.co.la.ca.us/BOSPolicyFrame.htm>.

In addition, the court settlement in August 2007 regarding the lack of GHG mitigation strategies in the San Bernardino County General Plan prompted Los Angeles County to pursue more immediate and formal mitigation strategies. Accordingly, the County prepared its *Report on the Impact of the State Action Against San Bernardino County Regarding its General Plan Update*, which contains numerous recommendations for future requirements to combat global warming.⁴⁰ The report has three main sections: (1) energy efficiency and climate change, (2) green buildings, and (3) low-impact development.

In order to secure implementation of green building practices, the Board of Supervisors adopted three ordinances pursuant to the County's Green Building Program on October 7, 2008, relating to green building, low-impact development, and native, drought-tolerant landscaping. These ordinances became applicable in unincorporated portions of Los Angeles County as of January 1, 2009.

The green building standards ordinance applies to four categories of development, with corresponding requirements for each: (1) small residential and nonresidential projects; (2) medium-sized residential projects; (3) medium-sized (i.e., 10,000 to 25,000 square feet) nonresidential, commercial, mixed-use, or first-time tenant improvement projects; and (4) large nonresidential, commercial, mixed-use, or first-time tenant improvement projects greater than 25,000 square feet, and all new high-rise buildings greater than 75 feet in height. In addition, the adopted ordinance contains minimum standards for all applicable projects:

- **Energy:** 15 percent better than Title 24;
- **Water:** Smart controller in landscaped areas, 75 percent of the landscaped area to use drought-tolerant plants, turf restrictions, hydrozones;
- **Resources:** Minimum 50 percent waste diversion during construction;
- **Trees:** Two trees planted per single-family home, one tree planted per 5,000 square feet of lot area for multi-family projects, three trees planted per 10,000 square feet of lot area for nonresidential projects; and
- **Low Impact Development:** Single-family residences to use three of seven approved low-impact development best management practices.

40 County of Los Angeles, "Report on the Impact of the State Action Against San Bernardino County Regarding its General Plan Update." October 15, 2007. Available online: http://file.lacounty.gov/bc/q4_2007/cms1_076485.pdf.

City of Azusa General Plan

The City's General Plan is primarily a policy document that sets goals concerning the community and gives direction to growth and development. In addition, it outlines the programs that were developed to accomplish the goals and policies of the General Plan. City programs pertaining to greenhouse gas emissions are included in Natural Environment Chapter of the City's General Plan. These programs include the following, among others:

Air Quality Implementation Programs:

AQ2 Land Use Patterns Encouraging Alternative Transportation

Encourage land use patterns that enable people to use alternative transportation methods such as transit, walking, and cycling in their day-to-day activities. Expand opportunities for people to live and work in close proximity.

AQ3 Promote Mixed-Use Development

Promote mixed-use development that provides commercial services close to residential zones and employment centers, enabling citizens to walk or bicycle to services rather than drive.

AQ5 Provide Sidewalks, Bicycle Lanes, and Bus Shelters

Continue to require new development and significant renovation projects to include sidewalks, bicycle lanes, and bus shelters allowing for easy use of alternative modes of transportation.

4.6.3 ENVIRONMENTAL IMPACTS

Thresholds of Significance

The following thresholds for determining the significance of impacts related to GHG emissions are contained in the environmental checklist form contained in Appendix G of the most recent update of the *State CEQA Statutes and Guidelines*. Adoption and/or implementation of the Azusa TOD Specific Plan could result in significant adverse impacts associated with GHG emissions, if any of the following could occur:

Threshold GHG-1 Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or

Threshold GHG-2 Would operation of the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

State CEQA Guidelines Section 15064.7 states the significance criteria established by the applicable air quality management district or air pollution control district, when available, may be relied upon to make determinations of significance. The first significance criteria may be evaluated by directly calculating GHG emissions from a project. As previously discussed, the SCAQMD has published draft guidance documents that have not yet been formally adopted. The SCAQMD is currently developing thresholds for GHG emissions and currently recommends a tiered approach. A brief summary of the available draft guidance document from the SCAQMD is provided below.

- The Tier 3 threshold, for a presumption of a less than significant impact, requires a project's incremental increase in GHG emissions to be below or mitigated to less than the significance screening level of 3,000 MTCO_{2e} for mixed-use or all land use projects.
- The Tier 4 threshold, for a presumption of a less than significant impact, requires a project to achieve a 28 percent reduction from a base case scenario, including land use sector reductions from AB 32 (total emissions not to exceed 25,000 MTCO_{2e}) or achieve a project-level efficiency target of 4.6 MTCO_{2e} per service population per year (total emissions not to exceed 25,000 MTCO_{2e} per year). The recommended plan-level significance threshold is an efficiency target of 6.6 MTCO_{2e} per service population per year.

The second significance criteria may be evaluated by demonstrating compliance with plans, policies, or regulations adopted by local governments to curb GHG emissions. According to the Natural Resources Agency:

Provided that such plans contain specific requirements with respect to resources that are within the agency's jurisdiction to avoid or substantially lessen the agency's contributions to GHG emissions, both from its own projects and from private projects it has approved or will approve, such plans may be appropriately relied on in a cumulative impacts analysis.⁴¹

The State of California, through its Governor and Legislature, has established a comprehensive framework for the substantial reduction of GHG emissions. As previously discussed, this will occur primarily through the implementation of AB 32 and Executive Order S-3-05, which addresses the reduction of GHG emissions on a statewide cumulative basis.

⁴¹ Natural Resources Agency, *Final Statement of Reasons for Regulatory Action: Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB 97, 2009*. 15.

Methodology

GHG emissions were computed for the full buildout scenario. Specifically, construction emissions were computed for an assumed 1-year average construction period for the projects proposed for construction between the years 2015 through 2035. Operational emissions were estimated for 2035, the first complete year of full project occupancy. The California Emissions Estimator Model Version 2013.2.2 (CalEEMod) was used to estimate GHG emissions. Modeling output that includes assumptions is provided as the CalEEMod model output in **Appendix 4.2**.

Impacts and Analysis

Threshold GHG-1: Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment (i.e., on global climate change)?

Construction

Development under the Azusa TOD Specific Plan would result in the generation of GHG emissions, both directly and indirectly. During construction, the project would directly contribute to climate change through its contribution of the GHGs from the exhaust of construction equipment and construction workers' vehicles. The manufacture of construction materials used by the project would indirectly contribute to climate change (upstream emission source). Upstream emissions are emissions that are generated during the manufacture of products used for construction (e.g., cement, steel, and transport of materials to the region). The upstream GHG emissions for this project, which may also include perfluorocarbons and sulfur hexafluoride, are not estimated in this impact analysis because they are not within the control of the City of Azusa and the lack of data precludes their quantification without speculation.

The primary GHG emissions during construction are CO₂, CH₄, and N₂O. These emissions are the result of fuel combustion by construction equipment and motor vehicles. The other GHGs defined by state law (hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) are typically associated with specific industrial sources and processes and would not be emitted during construction of the project. The CalEEMod software was used to estimate the construction-related CO₂ emissions using the same assumptions described in **Section 4.2, Air Quality**, for the construction portion of the air quality analysis. Because detailed information regarding construction phasing and scheduling was not available for future projects under the Azusa TOD Specific Plan, the proposed dwelling units and retail, commercial, and industrial square footage were averaged for one year (assuming construction under the Azusa TOD Specific Plan begins in 2015 and concludes in 2035). Site preparation, building construction, asphalt

paving, and architectural coating activities were assumed to occur throughout the year. In reality, construction activity would occur in spurts as individual projects are designed in detail, approved, and constructed. However, while the year-to-year construction-related GHG emissions would vary, the total construction-related GHG emissions should adequately and reasonably reflect the full extent of development allowed under the Azusa TOD Specific Plan.

CARB has adopted measures that would reduce construction-related GHG emissions in its *Climate Change Scoping Plan* for AB 32. For instance, SPM-5, Low carbon fuel standard when in effect is expected to result in a 7.2 percent reduction in transportation GHG emissions); SPM-7, Vehicle efficiency measures for passenger vehicles is expected to reduce transportation GHG emissions by 2.8 percent; and SPM-10, Vehicle hybridization and energy efficiency standards adopted for medium- and heavy-duty vehicles are expected to result in a 2.9 percent reduction in transportation GHG emissions. However, it is unlikely that these measures would be in full effect during the early years of construction. The latter years of construction would potentially realize a reduction in GHG emissions from these measures. Since the implementation schedule for these measures has not yet been determined, reductions from these measures were not applied and so emissions estimates should be seen as conservative. The estimated construction-related GHG emissions are provided in **Table 4.6-3, Azusa TOD Specific Plan Estimated Construction GHG Emissions.**

**Table 4.6-3
Azusa TOD Specific Plan Estimated Construction GHG Emissions**

Year	Project Emissions (Metric Tons CO ₂ e/year)
Average emissions per year	1,025
Total GHG Emissions (20 years)	20,500
Amortized GHG Emissions¹	693

Source: Impact Sciences, Inc., (2015). Emissions calculations are provided in **Appendix 4.2.**

¹ Amortized GHG emissions are calculated by dividing the total construction GHG emissions over a recommended project lifetime of 30 years.

Construction GHG emissions would occur only when construction activities are underway. However, it is common practice to amortize construction-related GHG emissions over the project's lifetime in order to include these emissions as part of a project's amortized lifetime total emissions so that GHG reduction measures would address construction GHG emissions as part of the operational GHG reduction strategies. The SCAQMD's Draft GHG CEQA Guidance recommends using 30 years as a project

lifetime.⁴² Therefore, the construction GHG emissions have been amortized over a 30-year period and included in the amortized operational total discussed in the next section.

Operational

It is anticipated that the development under the Azusa TOD Specific Plan would be built out and operational by 2035. Once operational, the development would result in GHG emissions, primarily CO₂, CH₄, and N₂O, as a result of fuel combustion from building heating systems and motor vehicles. Building and motor vehicle air conditioning systems may use HFCs (and HCFCs and CFCs to the extent that they have not been completely phased out at later dates); however, these emissions are not quantified since they would only occur through accidental leaks. It is not possible to estimate the frequency of accidental leaks without some level of speculation. It should be noted that CARB has drafted a proposed “Regulation for Management of High Global Warming Potential Refrigerants” that would reduce emissions of these refrigerants from stationary refrigeration and air conditioning systems by requiring persons subject to the rule to reclaim, recover, or recycle refrigerant and to properly repair or replace faulty refrigeration and air conditioning equipment.⁴³

Direct emissions of CO₂ emitted from operation of the development include area source emissions (from natural gas consumption) and mobile source emissions. Area source emissions were calculated using CalEEMod using default assumptions for various types of residential, retail, office space, and light industrial space. Mobile source emissions were calculated using CalEEMod, based on the traffic study prepared for the project and the Institute of Transportation and Engineering 8th Edition trip generation rates.⁴⁴

The future development would also result in indirect GHG emissions due to the electricity demand. The emission factor for CO₂ due to electrical demand from Southern California Edison, the electrical utility serving the project area, was selected in the CalEEMod model. Emission factors for CO₂ are based on CARB’s Local Government Operations Protocol.⁴⁵ Emission factors for CH₄ and N₂O are based on E-Grid values.⁴⁶ The cited factors in the CARB report are based on data collected by the California Climate Action Registry. The emission factors take into account the current mix of energy sources used to

⁴² South Coast Air Quality Management District (SCAQMD). *Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold*. 2008.

⁴³ California Air Resources Board, “Stationary Equipment Refrigerant Management Program,” <http://www.arb.ca.gov/cc/reftrack/reftrack.htm>. This regulation is an early action measure under AB 32. 2009.

⁴⁴ Institute of Transportation and Engineering, *ITE Trip Generation Rates – 8th Edition*, 2008.

⁴⁵ California Air Resources Board, *Local Government Operations Protocol for the Quantification and Reporting of Greenhouse Gas Emissions Inventories*, Version 1.1, 2010. 208.

⁴⁶ US EPA, “E-Grid,” <http://www.epa.gov/cleanenergy/energy-resources/egrid/index.html>.

generate electricity and the relative carbon intensities of these sources, and includes natural gas, coal, nuclear, large hydroelectric, and other renewable sources of energy. Electricity consumption was based on default data found in CalEEMod.

In addition to electrical demand, the project would also result in indirect GHG emissions due to water consumption, wastewater treatment, and solid waste generation. GHG emissions from water consumption are due to the electricity needed to convey, treat, and distribute water. The annual electrical demand factors for potable water were obtained from the CEC.⁴⁷ The default CalEEMod assumptions were used for GHG emissions from water consumption, wastewater production, and solid waste generation.

A summary of the operational emissions of the project is provided below in **Table 4.6-4, Estimated Operational GHG Emissions in 2035**. Detailed emission calculations are provided in **Appendix 4.2**. The estimates include some reductions from policies, strategies, and mitigation measures from AB 32, Title 24, and the Azusa TOD Specific Plan itself, such as increased energy efficiency standards included as part of the 2013 Title 24 standards, reduced traffic due to a focus on pedestrian- and bicycle-friendly streets, waste reduction due to a focus on recycling, use of low-flow water fixtures, and others. The total emissions are compared to the SCAQMD plan-level efficiency threshold of 6.6 metric tons of CO_{2e} per year per service population. The “service population” of a project is defined as the total of residents and employees associated with a project. For this project, the service population was estimated to be 4,151 persons, based on 2,915 new residents (840 dwelling units multiplied by 3.47 persons per household) and 1,236 new jobs.

⁴⁷ California Energy Commission, *Refining Estimates of Water-Related Energy Use in California, PIER Final Project Report*, CEC-500-2006-118, 2006 22. Prepared by Navigant Consulting, Inc.

**Table 4.6-4
Estimated Operational GHG Emissions in 2035**

Source	GHG Emissions (Metric Tons CO ₂ e/year)
Area	14
Energy	3,566
Mobile Sources	19,353
Waste	401
Water	677
Amortized Construction	683
Total GHG Emissions	24,694
GHG Emissions per Service Population	5.9
SCAQMD Threshold	6.6
Exceeds Threshold?	NO

*Source: Impact Sciences, Inc. (2015). Emission calculations are provided in Appendix 4.2.
Note: Totals in table may not appear to add exactly due to rounding.*

As shown the emissions per service population would be less than the SCAQMD threshold. Therefore, the project's impact would be considered less than significant.

Level of Significance Before Mitigation

Impacts would be less than significant.

Mitigation Measures

No mitigation measures are required.

Level of Significance After Mitigation

Impacts would be less than significant.

Threshold GHG-2: Would operation of the Azusa TOD Specific Plan conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions?

The project would result in a significant impact related to GHG emissions if the project was in conflict with an applicable plan, policy, or regulation concerning GHG reductions. AB 32 and Transit Oriented Development Planning Grant Program are the relevant plans with which to review compliance.

AB 32 Consistency Analysis

AB 32 is the basis for reduction of GHG emissions in California. Local agencies such as the SCAQMD base their planning and regulations on the requirements included in AB 32, which include a reduction of GHG emissions to 1990 rates by 2020. The SCAQMD adopted the GHG significance thresholds specifically to meet AB 32 requirements within its jurisdiction, and so plans and projects that meet those thresholds can be assumed to meet the requirements of AB 32. As the per capita GHG emissions from the project are well below the SCAQMD efficiency threshold for GHG emissions, the project is in compliance with AB 32. Furthermore, the Azusa TOD Specific Plan would be primarily infill and transit-oriented development located close to the Gold Line light rail stations in the area; the future Azusa Downtown and APU/Citrus College Gold Line Stations. The Specific Plan recommends numerous features to promote travel by alternate means and reduce vehicular travel and associated GHG emissions (see Specific Plan Section 3.0 – Mobility, Complete Streets, and Streetscape Improvements). Pedestrian thoroughways would be developed to and from the future Azusa Downtown Gold Line Station. Streetscapes and landscapes would be designed to improve walking, bicycling, and transit use options. The Specific Plan would develop retail space which could include offices, restaurants, and other shops, which would provide town centers and reduce vehicle trips for existing and projected residents. The increase in public transit support and local shopping options would reduce vehicle trips and consequently reduce GHG emissions. The Azusa TOD Specific Plan would comply with AB 32. The impact would be less than significant.

Transit Oriented Development Planning Grant Program

The Transit Oriented Development (TOD) Planning Grant Program (TOD Program) provides grants for local agencies in Los Angeles County to develop land use regulations that support TOD. One of the goals of the TOD Program is to reduce GHG emissions by encouraging infill development near transit. The Azusa TOD Specific Plan would develop vacant parcels as well as encourage infill within the urban areas of the City of Azusa (see Specific Plan Section 1.0 – Introduction). Redevelopment of nonconforming uses would occur when the current owner decides to sell. The proposed infill development including new dwelling units and associated services are proposed next to two proposed Gold Line light rail stations. This development is transit oriented, which would reduce vehicle trips and subsequently GHG emissions. The Azusa TOD Specific Plan would comply with the TOD Program. The impact would be less than significant.

Level of Significance Before Mitigation

Impacts would be less than significant.

Mitigation Measures

No mitigation measures are required.

Level of Significance After Mitigation

Impacts would be less than significant.

4.6.4 CUMULATIVE IMPACTS

Global climate change is by definition a cumulative impact as GHG emissions do not have a localized impact; they impact the globe as a whole. Since GHGs typically remain in the atmosphere for an extended period they ultimately mix with emissions from other sources, both local and distant. The impacts of the emissions from any one project cannot be distinguished from the impacts of any other project in the same air basin, state or anywhere on the globe. Therefore GHG reductions measures in California aim to reduce emissions on a statewide basis, specifically through the requirements of AB 32. The significance threshold set forth above is calculated to allow a specific region to meet these overall statewide targets by requiring substantial projects to match the reductions from business as usual required for the state as a whole in AB 32. Consequently, while the thresholds are applied to individual projects, they also serve as cumulative impact thresholds. Therefore the analysis presented in the section, above, leads to a conclusion that the Azusa TOD Specific Plan's contribution to cumulative impacts is less than significant.

Level of Significance Before Mitigation

Impacts would be less than significant.

Mitigation Measures

No mitigation measures are required.

Level of Significance After Mitigation

Impacts would be less than significant.